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CERAMIC SEQUENCES IN EASTERN PENNSYLVANIA

The archeology of the Delaware and Susquehanna Valleys, viewed temporally and spacially, presents a picture of considerable complexity. The early archeology of the area is relatively homogeneous, but several major areas of cultural development can be recognized in the later history of each valley. The transformations of material culture with time were as great as those in neighboring areas of the Eastern Woodlands. For many sections of Pennsylvania there is little data available, and material from excavated sites is so sparse that most of my information is derived from local collections and from surveys and excavations of the past two years. As a result, this report is limited to the areas with which I have had some experience, and does not pretend to include all of eastern Pennsylvania or all of the ceramic types in the areas with which I am familiar.[1]

Because in this region cultural development seems to have been sequential, with growth and diffusion rather than migration and displacement as the major processes contributing to change in material culture, division of the sequence into periods is arbitrary. For my own purposes, I recognize three major divisions of the ceramic portion of this history as follows: Early Woodland, characterized by a high propor-

tion of large stemmed, corner-removed, pentagonal or leaf-shaped projectile points, mostly of such coarse materials as ryolite, argillite, slate, and quartz; Middle Woodland, characterized by a majority of semi-lozonge, side-notched, corner-notched, barbed, and stemmed projectile points in great variety and made generally from flints, jaspers, and cherts; Late Woodland, characterized by a preponderance of triangular points, made mostly of jaspers, flints, and cherts. No Early Woodland site has yet been excavated in Pennsylvania, but I consider Koens-Crispin in New Jersey as typical of this horizon and containing an Archaic-Early Woodland transition; Mary Butler's Broomall Rock Shelters in Delaware County, Pennsylvania,[2] are typical Middle Woodland with intermixed earlier material, while the Overpeck Site at Kintnersville, Bucks County, is a typical Late Woodland Site.[3] Each of these terms does not imply a single complex, but rather a convenient segment of our archeological history. Because projectile point forms were functionally conditioned and culturally determined, and because any collection can be analyzed most easily by its projectile point content, I prefer to use this artifact series as a background for the study of other archeological materials.

Properly our study of eastern Pennsylvania pottery begins with the last pre-ceramic horizon in the Susquehanna Valley, best represented by a large site near Milan, Bradford County. Here steatite sherds are found on a site with large stemmed, leaf-shaped, and pentagonal points of rhyolite and argillite, large heavy steatite gorgets, adzes, long T-shaped drills, and large end scrapers. This complex is suggestive of the lower pre-ceramic level at Poplar Island, Dauphin County,[4] and of the Koens-Crispin site in New Jersey. The same complex recurrs at a nearby site, with the addition of steatite tempered pots of the same shape as the stone vessels. These pottery vessels are thick-walled, ~~and~~ fillet-built, with flat lugs below the rim, rounded lip, smoothed walls, and flat bases which meet the walls at almost a right angle. The paste is soft, gray to brownish-gray in color, and contains a very high proportion, over 50%, of steatite fragments up to two-thirds of an inch long. The flat bases show the impression of a coarse plain plaited fabric, with a rod warp and a two-element twisted cord weft. This pottery type is found along the Susquehanna for some distance north into New York, on the Delaware north to the Water Gap, and along the Potomac River in Virginia and Maryland. Many such sites are far from any steatite sources and it seems likely the tempering material consists of smashed up stone vessels.

This seems to represent the earliest pottery type throughout the area, and apparently is restricted to sites of this Early Woodland stage. In shape it closely resembles the Baumer material from southern Indiana, Fayette Thick and Adena Plain of the Adena Complex in Kentucky, and certain fiber temper wares of the Southeast, all of which represent very early ceramic complexes in their areas. This steatite tempered ware would seem to represent either an American invention of pottery, or a remarkable transferance of most of the features of stone vessels to pottery vessels. Perhaps only the general technique of pottery making first diffused to this region. There is some evidence that stone vessels remained in use later than their steatite-tempered copies, which seem to pertain to a pre-Adena or early Adena time period.[5]

Of wider distribution and greater extent in time is the next pottery type, Vinette 1, which overlaps with and replaces the steatite tempered vessels. Typical Vinette 1 sherds, as found at most of the Early and Early Middle Woodland sites which I have examined closely, is thick, soft, light reddish brown to black, fillet-built, has a large proportion of very coarse crushed rock temper, and is undecorated.[6]

The vessel interior is entirely covered with coarse, horizontal cord impressions, apparently made by a cord-wrapped anvil, and the exterior with the impressions of a cord-wrapped paddle. The vessels are straight-sided with thinned lips and sub-conical bases. This is the majority pottery type of most eastern Pennsylvania sites with finely made, quite varied jasper projectile points of non-triangular forms, and is the only pottery type found on the blocked-end-tube producing sites which I have examined. This is the earliest pottery type in most of New York and southern New England, and is also found throughout most of New Jersey, Pennsylvania, and Maryland. It is remarkably uniform throughout most of its range.

One other Early Woodland pottery type is conspicuous in the Delaware Valley but so far not noted in the Susquehanna. The vessel shape and lip form are like those of Vinette 1, but the sherds are thinner, sand tempered, reddish, and soft. The pots are undecorated but covered on the exterior with cord-wrapped paddle impressions, often criscrossed; some sherds show partially obliterated horizontal cordmarks on the interior for several inches below the lip, and some interiors show scraping and thinning. This pottery type is apparently identical with Joffre Coe's early Clarksville Cord Marked from Virginia.[7]

A few fabric impressed sherds are apparently present in Early and Middle Woodland horizons in the Delaware Valley, but are not abundant in Pennsylvania, and resemble the earliest pottery type of Western North Carolina and eastern Tennessee, as well as Coe's early Rowan series on the Piedmont.

The Early Woodland sites, and, in part, Middle Woodland sites, in eastern Pennsylvania show a ceramic complex with almost no decoration and with quite elemental vessel shapes. For example, the preceeding types apparently represent the total ceramic complex at the Koens-Crispin Site. Despite our general idea that pottery is the most changeable and variable phase of material culture, such pottery types as Vinette 1 appear to be more stable and more slowly modified than projectile point forms in the same complexes.

The only major discontinuity in ceramic tradition which occurs in this region comes with the introduction, whether by migration or diffusion, of several new pottery complexes into the Northeast at apparently a Hopewell time level. Ritchie's Vinette 2 series, which appears in New York at this time, is almost entirely absent in Eastern Pennsylvania. Instead, two distinct but related pottery types are introduced into the Delaware and Susquehanna Valleys. On the Susquehanna

we find large, thick-walled, straight-sided to slightly everted rimmed vessels with coarse cordmarked exteriors and floated interiors, with abundant coarse crushed rock temper and crumbly, light colored, paste. These are best represented from the upper horizon at the Poplar Island Site in Dauphin County, where the sherds occurred in pits with medium-sized corner-notched, triangular, barbed, and semi-lozonge shaped projectile points of jasper, tiny thin retouched flake endscrapers of quartz, three-quarter grooved axes, ~~steatite sherds~~, a curved-base steatite platform pipe, and pyrites fire making sets with imbedded chert strike-a-lights.[9] Some pottery of this type appears also on Middle Woodland sites in Bucks County. This pottery type is very closely related to Ritchie's Geneseo Cordmarked from the New York Hopewellian and Griffin's Woodland Cordmarked from the Sugar Run Mound and Village Site in Northwestern Pennsylvania.[10] The other major type introduced into the Delaware Valley is best represented at Abbott Farm in New Jersey, which seems to be the local center for this style, best described from the New Jersey material.[11] These are thick-walled, soft, square-lipped, conical-bottomed vessels tempered with coarse crushed rock, limestone, or shell, some few with a sharply defined rim. The neck or rim area for several inches below the lip is covered with elaborate,

often zoned designs outlined in incising or dentate-stamping, the zones filled with incising, dentate stamping, or net impressions. This pottery type is ancestral to Overpeck Incised of the protohistoric Delaware sites, described later, to Slaughter Creek Incised from Delaware, to Indian Head Incised of New Jersey,[13] and to Carlyle Smith's Bowman's Brook Incised[14] of the New York City area. Some of Volk's material from the Rowan Farm Site near Trenton, New Jersey, is Overpeck Incised in the earlier type ~~is transitional to these later types.~~[15] This Middle Woodland pottery type is found north to the Water Gap. It is quite probable that the incising technique which differentiates Iroquois pottery from earlier ceramic types in New York originated here. Incising may have diffused to late Owasco horizons to the north from this area, which is the only strong center for incised pottery decoration at so early a period in the regions adjacent to the Iroquois. The introduction of this pottery style into the Delaware Valley is the only shift in the archeology of the area which might be correlated with Delaware immigration as described in the Walam Olum text. The Early and Middle Woodland periods were characterized by a great deal of inter-areal contact, as indicated by trade pieces on eastern Pennsylvania sites from Ohio Adena, Ohio Hopewell, New York Point Penninsula,

and other complexes not yet identified. This contact apparently came to a climax with the introduction of new ceramic styles and artifacts into eastern Pennsylvania and the entry of a dilute Hopewell complex into western Pennsylvania.[16]

Also conspicuous in Middle Woodland associations is a net-impressed pottery type, best known from eastern Maryland and Virginia, of conical form, thickwalled, soft, tempered with grit or shell, and generally undecorated.[17] The characteristic net impressions are often obscured by the knots of the netting, which are frequently as large as the interstices, and by multiple impression of the fabric. The presence of identical net impressions within the incised zones of the Abbot Farm incised series, discussed earlier, is a clear indication thatthe two types are contemporary in New Jersey.

Even later Middle Woodland sites, however, have large proportions of pottery wares clearly descended from earlier local types. The sand-tempered cordmarked and the Vinette 1 styles apparently continued their existance through much of the Middle Woodland period. Particularly interesting are the Vinette 1 variants from later Middle Woodland sites. The sherds are thinner, slightly harder, and blacker than typical Vinette 1; they have a smaller proportion of finer crushed

rock temper, and the cordmarks on the interior and exterior surfaces are often partially obliterated and are not so coarse as on the earlier ware. Present on many eastern Pennsylvania Middle Woodland sites, it is also characteristic of western and central Pennsylvania mounds, where it is associated with Woodland Cordmarked sherds at a Hopewell time level.[18]

The Late Woodland period is apparently a time of more sedentary life and greater areal isolation. At least three regions of distinct development must be recognized for the Delaware, and at least two for the Susquehanna. Trade pieces which have been carried long distances are uncommon although trade sherds are frequent, and greater areal differentiation is apparent. Projectile point types and pottery vessel shapes are very much alike at the same late horizons in these areas, however, and similar trends are apparently represented in each sequence.

The Delaware drainage north and west of the mouth of the Lehigh represents one area in which an Owasco-Iroquois sequence ends with historic Munsee, while the Susquehanna drainage north of the forks shows a related Owasco-Iroquois sequence which culminates in historic Andaste. Both of these areas were culture and population centers, with a great variety of ceramic types, many of them transitional, which seem to

stem from Woodland Cordmarked pottery styles in the late Middle Woodland period. In late prehistoric times, these areas exerted considerable influence on pottery styles throughout the lower Delaware and Susquehanna Valleys. At an early historic time level ceramic complexes from these northern areas were replacing the already-modified ceramic styles of more southern groups. Any adequate discussion of the Munsee and Andaste areas would require much more data than I yet have available.

In the Lebanon County area on the Susquehanna, the Late Woodland ceramic complexes are related, but not very closely, to Baum Cordmarked in Fort Ancient, to Joffre Coe's Siouan pottery from Virginia, and to the Gala Site wares from West Virginia.[19] Many of the incised sherds seem identical with some of Carl Schmidt's Shepherd Farm specimens, described from Maryland material.[20]

Swatara Cordmarked is a fairly hard, medium grit tempered, medium thick, brown to reddish brown pottery with round base, heavy cordmarking, an applied rimstrip which is cordmarked and blended to the neck, and a constricted neck which is frequently encircled by several parallel incised lines. Some vessels lack the rimstrip and have a strongly outflaring lip, with simple incised decoration. Others have a notched rim edge and parallel lines or triangular plats incised

over cordmarking on the rims, and should constitute at least one other pottery type. This ceramic sequence was becoming markedly Iroquoian, and some traits which ~~probably~~ may have originated in this pottery type occur in the earliest Susquehannock pottery at Safe Harbor and Washingtonboro. This pre-Susquehannock sequence apparently continued in this area until the contact period, and was probably then displaced or absorbed by Susquehannock invasions from the North.[21]

The earliest Susquehannock horizon, if it be Susquehannock, on the lower river is characterized by sparse trade goods, abundant stone arrowheads, and well-made pottery which is almost all grit tempered and relatively homogenous in appearance. These pots have a moderately high, strongly convex collar with no rim thickening, generally a notched lip, and incised decoration over cordmarking. The incised designs are triangular, rectangular, ~~and~~ diamond-shaped, and hexagonal plats, frequently with rows of small punctates between incised lines, Face effigies, elaborate castellations, nodes at the rim edge, rim thickening, and heavy linear punctate lines are apparently absent. The style of incising over cordmarking looks very like that on the pre-Susquehannock wares.[22]

The well known later Susquehannock shell-tempered pottery of the full blown historic period may be descended from this type, but shows much closer relationship to pottery from the

Andaste and Cayuga areas. The almost grotesque over-elaboration of the high collars, effigies, castellations, linear punctate zones, noded rims, and the double pots and double mouthed pots reflect trends in other areas, and may have some correlation with intense European contact and the appearance of mixed Iroquois bands in the Susquehanna Valley. Finally, in late Susquehannock graves, on which trade goods were lavished, we find the last Susquehannock pottery. The paste is soft, poorly fired, black to brown, and tempered with small quantities of shells. The incised decoration has disappeared, while the cordmarking extends to the lip and the vessel shapes are clumsy.[23]

In the Bucks County area a number of small Late Woodland sites, of which the Overpeck site at Kintnersville is typical, are located on the river bottoms. The lower level at the Overpeck site appears to represent an Owasco ~~Castle Creek~~ time level, while the upper level is at an Iroquois time level. No Iroquois sherds were found in the lower horizon, but a few Owasco ~~Castle Creek~~ sherds were present. The majority type of the lower level was Overpeck Incised, a crushed-rock tempered, fairly hard, gritty textured, and impressed ware with complex non-Iroquoian incised designs on a somewhat concave neck area. The body sherds are almost always very red, while rim sherds

show more brownish and blackish areas. Very little of this pottery type was found in the upper level, and the ~~single~~ two rim from the upper level bore an incised triangular plat design of Iroquois derivation. This pottery type is closely related to Indian Head Incised of New Jersey, to Bowman's Brook Incised from the New York City area, and Slaughter Creek Incised of Delaware, and is descended from the Abbott Farm zoned incised pottery. Also conspicuous from the lower level is a very soft and crumbly sand-tempered ware with incised simple herringbone designs on ~~nubbled~~ necks, poorly fired and red and black in color. Similar sand-tempered sherds, more heavily cordmarked and without decoration, were conspicuous in the upper level. These wares are apparently descended from local sand-tempered pottery types whose history extends back into the Early Woodland period in this area; the whole sand-tempered series needs further analysis for type description. In the upper level, Iroquois-Owasco types have largely replaced the local incised wares. ~~Most~~ All of the Castle Creek rims from the upper level have thickened collars, and the paste is harder, better fired, and gray to red gray in color. Fine cordmarking on the bodysherds has been smoothed over. The Iroquois series is closely related to that of the Mansee area, and portions of ~~two~~ shell tempered Susquehannock trade pots ~~and a trade sherd of Hudson River Incised from the Mahican area~~ are present.[24]

The nearby Diehl Site, at Monroe, yielded a very small sample of historic Delaware pottery. Castle Creek sherds almost like those of the upper level at Kintnersville were present, with Iroquois sherds of Mohawk-like appearance, and a Susquehannock trade sherd. Also represented in the sample are shell and grit tempered sherds with incised decoration over cord-marked rims, and notched flat lips. They suggest Susquehannock techniques and yet are distinct from any Susquehannock material with which I am familiar. It is unfortunate that more of the Diehl Site was not preserved, for this site appears to represent the seventeenth century Delaware-Shawnee town of Pechqueolin.[25]

1. I should here like to express my thanks to the many collectors, local students, and landowners who have contributed to this report, and to Dr. William A. Ritchie, Dr. Dorothy Cross, and Dr. Catherine McCann for access to their materials and data. I have drawn heavily on the New Jersey material because a much better sample is available from sites on the eastern bank of the Delaware and because many of these pottery types were first known from New Jersey sites. Drs. Cross and McCann have been especially helpful, and have made accessible the total materials from crucial New Jersey sites, even when this involved the unpacking of materials which had just been moved to new quarters. I have tried to trespass as little as possible, however, and this paper does not attempt any adequate picture of New Jersey archeology, nor does it necessarily reflect the interpretation of those working in that area.

2. Hawkes and Linton, 1916
   Linton and Hawkes, 1917
   Cross, 1941, p. 81 - 90
   Butler, 1946, p. 120
   Butler, 1947

3. Excavated by Richard S. MacNeish and myself in August, 1947. A report on this site is in progress, and only the most preliminary statements are made in this paper.

4. Witthoft, 1946, p. 123 - 124

5. Cross, 1941, p. 60, 61, 65, 66, 88 - 89, 177, 182, pl 22A, fig. 4, 24, 26

6. Ritchie, 1938, p. 12, 18, 34
   Ritchie, 1944, p. 192
   Ritchie, 1946, p. 13, 16 - 17, 31 - 33
   Cross, 1941, p. 33, 81, 126, 178, pl. 32, fig. 4, 60, fig. 9. Vinette 1 pottery is relatively abundant in New Jersey.

7. Coe, N.D.A
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22. Cadzow, 1936, pl.

23. Cadzow, 1936, pl.

24. These statements are based on MacNeish's recent study of Iroquois ceramic traits, which will soon be published.

25. The Diehl site was partially excavated by MacNeish and myself in July, 1947, and a report is in preparation.

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The archaeology of the Delaware and Susquehanna Valleys, viewed temporally and spacially, presents a picture of considerable complexity. The early archaeology of the area is relatively homogeneous, but several major areas of cultural development can be recognized in the later history of each valley. The transformations of material culture with time were as great as those in neighboring areas of the Eastern Woodlands. For many sections of Pennsylvania there is little data available, and material from excavated sites is so sparse that most of my information is derived from local collections and from surveys and excavations of the past two years. As a result, this report is limited to the areas with which I have had some experience, and does not pretend to include all of eastern Pennsylvania or all of the ceramic types in the areas with which I am familiar.[1]

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1. I particularly wish to thank the innumerable local students, collectors, and landowners who have in some way or other contributed to this report, especially Messrs. Earl G. Hoacock, Sam S. Farver, Leroy Vanderpool, and Charles Lucy for the use of large series of ceramic materials. Special gratitude is also due Dr. William A. Ritchie, Dr. Dorothy Cross, and Dr. Catherine McCann for comparative data and fruitful discussions relating to the problems involved. Cross and McCann made available the total collections of the New Jersey State Museum, although this meant unpacking material in process of removal to new quarters and involved great inconvenience to them. I fear I have trespassed too much in New Jersey archaeology, but so much more data is available from that bank of the Delaware that I can scarcely do otherwise. Besides the previously mentioned collections and many other smaller private holdings, I have utilized the Pennsylvania material in the University Museum, Philadelphia, the Pennsylvania State Museum, Harrisburg, the Museum of the American Indian, Heye Foundation, New York, and the Ceramic Repository for the Eastern United States, University of Michigan, Ann Arbor, and also material in many of the local museums and historical societies throughout the area. While practically every person concerned with northeastern archaeology has contributed to this article, it does not necessarily reflect their conclusions.

Because in this region cultural development seems to have been sequential, with growth and diffusion rather than migration and displacement

as the major processes contributing to change in material culture, division of the sequence into periods is arbitrary. For my own purposes, I recognize three major divisions of the ceramic portion of this history as follows: Early Woodland, characterized by a high proportion of large stemmed, corner-removed, pentagonal or leaf-shaped projectile points, mostly of such coarse materials as ryolite, argillite, slate, and quartz; Middle Woodland, characterized by a majority of semi-lozenge, side-notched, corner-notched, barbed, and stemmed projectile points in great variety and made generally from flints, jaspers, and cherts; Late Woodland, characterized by a preponderance of triangular points, made mostly of jaspers, flints, and cherts. No Early Woodland site has yet been excavated in Pennsylvania, but I consider Koens-Crispin in New Jersey as typical of this horizon and containing an Archaid-Early Woodland transition.[2] The Abbott Farm Bluff Site and the Broomall Rock

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2. Cross, 1941, p.

Shelters[3] are typical Middle Woodland with intermixed earlier and later material,

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while the Overpeck Site at Kintnersville, Bucks County, is a typical Late Woodland site.[4] Each of these terms does not imply a single complex, but

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5. Witthoft, 1946.

Site in New Jersey. The same complex recurs at a nearby site, with the addition of steatite tempered pots of the same shape as the stone vessels. These pottery vessels are thick-walled, fillet-built, with flat lugs below the rim, rounded lip, smoothed walls, and flat bases which meet the walls at almost a right angle. The paste is soft, gray to brownish-gray in color, and contains a very high proportion, over 50%, of steatite fragments up to two-thirds of an inch long. The flat bases show the impression of a coarse plain plaited fabric, with a rod warp and a two-element twisted cord weft; sometimes the weft is widely spaced. (Pl. shows the basal edge with fabric impressions). This pottery type is found along the Susquehanna for some distance north into New York, on the Delaware north to the Water Gap throughout Western Pennsylvania, and along the Potomac River in Virginia and Maryland. Many such sites are far from any steatite sources and it seems likely the tempering material consists of smashed up stone vessels.

Holmes first recognized this pottery type in collections from sites in West Washington, D. C. He noted its association with steatite vessels of the same form, and indicated their relationship, but did not suggest the chronological significance of this linkage.[6] More recently Slattery excavated

6. Holmes, 1903, p. 157.

what is apparently a nearly pure Early Woodland site on Sheldon Island near Washington, and noted that this type (which should be called Washington Steatite Tempered) constituted almost ninety percent of the pottery from this site.[7]

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7. Slattery, 1946.

Manson has recently excavated the Marcy Creek Site, opposite Washington, D. C., where a strong component characterized by steatite tempered pottery (and Piedmont Cord-marked) was present in the plowed soil and four inches of "disturbed" soil, and overlay a non-ceramic horizon with steatite sherds. Manson distinguishes his Marcy Creek plain from Slattery's Seldon Island material, apparently without reason. Because of Holmes' earlier description of the type and because Manson's description appears to be misleading, I prefer to retain my earlier name for the type.[8]

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8. Manson, 1948.

This seems to represent the earliest pottery type throughout the area, and apparently is restricted to sites of this Early Woodland stage. In shape it closely resembles the Baumer material from southern Indiana, Fayette Thick and Adena Plain of the Adena complex in Kentucky, and certain fiber temper wares of the Southeast, all of which represent very early ceramic complexes in their areas. This steatite tempered ware would seem to represent either an American invention of pottery, or a remarkable transference of most of the features of stone vessels to pottery vessels. Perhaps only the general technique of pottery making first diffused to this region. There is some evidence that stone vessels remained in use later than their steatite-tempered copies, which seem to pertain to a pre-Adena or early Adena time period.[9]

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9. Cross, 1941, pl. illustrates a whole vessel.

Although Washington Steatite tempered is earlier than Vinette 1 in this area, it is very likely that Vinette 1 may be equally old in the northerly part of its range. To the south, Piedmont Cord-marked apparently represents the earliest pottery on the Piedmont. In the southern Appalachians, the ceramic sequence begins with fabric-impressed wares of the Watt's Bar Focus: In Georgia, related fabric-impressed types succeed the fiber tempered bowl-shaped vessels of the Orange Series. To the west, the sand tempered Alexander Series holds priority, while in the lower Mississippi Valley clay tempered Tchefuncte types are the first to appear. In the Ohio Valley several Adena types represent the earliest types, while related Baumer types are earliest further west. All of these diverse pottery traditions appear at roughly the same time period, all represent elemental shapes and a minimum of decoration, are poorly fired, are of coarse, clay-like texture, and are abundantly tempered; otherwise they have very little in common.

It might be possible to separate two series of Early Woodland types, one consisting of smooth surfaced bowl-shaped wares, the other of conoidal forms with malleated surfaces; intermediary forms are also present. Washington Steatite Tempered, some of the Adena types, the Tchefuncte types, and the Orange Series have smooth surfaces which show no traces of malleation and were apparently shaped by modeling; bases are flat or nearly so and the bowl shape is usual. The other series includes the conoical-shaped vessels of classical Woodland character, shaped by a paddle and anvil process and covered with the impressions of the cord or fabric wrapped paddle or of a fabric laid over the surface and paddled. In Pennsylvania, Georgia, Ohio, Kentucky, and Louisiana, we have some evidence that members of the first series were earlier than those of the second, and overlapped with and were replaced by them.

Where dentate stamping, paddle edge stamping, complex incised designs, shell edge impressions, interior scraping, zoned designs, neck constriction, carved paddle designs, and globular vessel shapes appear, they are first noted in an apparent third stage in our ceramic sequence, and with pottery types more closely related to the second postulated state, not the first. This hypothetical sequence may be valid for the whole Eastern Woodlands, considering that some areas may not have acquired a ceramic tradition until a later date than others, and can certainly be tested in the future.

The diversity of early pottery traditions, the homogeneity of early pottery types within large areas, and the near contemporaneity of these varied early types suggest some interesting ideas. In many cases the first pottery in an area is merely added to an already-present complex with no basic changes in physical type of cultural inventory. Thus the close of the Archaic cannot be correlated with any overall changes in population. There is apparently no necessary correlation with any basic cultural feature, such as agriculture, elaborate mortuary ritual with mound construction, or the bow: in fact pottery would appear to have preceded each of these into the Eastern Woodlands. No single ceramic pattern diffused throughout the area; no well-defined pottery tradition was introduced and carried intact throughout the Eastern Woodlands. In most cases the merest techniques of pottery-making and such basic features as general shape, type of surface treatment, and the addition of aplastics, were acquired by the local group and utilized in the production of a distinctive local tradition. Thus it is probable that in this process of transference, an introduced pottery tradition might have given rise to an apparently distinct pottery style in an adjacent area.

A closely related ceramic type differs from Washington Steatite Tempered in being tempered with crushed rock instead of steatite; some sherds indicate a smaller vessel with thinner walls. This rock tempered ware is

found in southeastern Pennsylvania, southern New Jersey, Delaware, and eastern Virginia; it is most abundant in the southern portion of its range, where Vinette 1 is absent.

Of wider distribution and greater extent in time is the next pottery type, Vinette 1, which overlaps with and replaces the steatite tempered vessels. Typical Vinette 1 sherds, as found at most of the Early and Early Middle Woodland sites which I have examined closely, are thick, soft, light reddish-brown to black, of clay-like texture, fillet-built, have a large proportion of very coarse crushed rock temper, and are undecorated.[10] The

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10. Ritchie, 1938, p. 12, 34.
Ritchie, 1940, p. 47, 85, 103, pl. XVI, 1, 3, XXX, 1, 2, 17-19, 20-22
Ritchie, 1944.
Ritchie, 1946.

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vessel interior is entirely covered with coarse, horizontal cord impressions, apparently made by a cord-wrapped anvil, and the exterior with the impressions of a cord-wrapped paddle; interior and exterior markings differ in type of cord. The vessels are straight-sided with thinned lips and sub-conical, baggy, bases. (Pl. shows the interior cord-marking.) This is the majority pottery type of most eastern Pennsylvania sites with finely made, quite varied jasper projectile points of non-triangular forms, and is the only pottery type found on the blocked-end-tube producing sites which I have examined. This is the earliest pottery type in most of New York and southern New England, and is also found throughout most of New Jersey, Pennsylvania, and Maryland. It is remarkably uniform throughout most of its range.

The western extent of Vinette 1 is indicated by the presence of eight bodysherds, in every way identical with typical New York specimens, in the fill of the Fort Wayne Mound near Detroit, Michigan, excavated by the Algonkian Research Club of Detroit in 1944. This is a Woodland mound characterized by Gibralter-like pottery, and these eight sherds probably represent earlier

material accidentally included in the mound fill.[11]

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11. These sherds were called to my attention by Dr. Emerson F. Greenman and Miss Ruth Howard, of the Museum of Anthropology, University of Michigan. The Fort Wayne Mound materials have been deposited in the Museum of Anthropology, University of Michigan.

One other Early Woodland pottery type is conspicuous in the Delaware Valley and the lower Susquehanna. The vessel shape and lip form are like those of Vinette 1, (often very bowl-like), but the sherds are thinner, abundantly sand tempered, reddish, and soft. The pots are undecorated but covered on the exterior with cord-wrapped paddle impressions; some sherds show partially obliterated horizontal cord-marks on the interior for several inches below the lip, and some interiors show scraping and thinning. This pottery type is apparently identical with Joffre Coe's early Piedmont Cord Marked from Virginia.[12] Griffin calls attention to other evidences of interior

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12. Coe, ms.

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cord-marking in the Middle West.[13] A few fabric impressed sherds are apparently

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13. Griffin, ms.

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present in Early and Middle Woodland horizons in the Delaware Valley, but are not abundant in Pennsylvania, and resemble the earliest pottery types of western North Carolina and eastern Tennessee, as well as Coe's early Rowan series on the Virginia Piedmont.[14]

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14. Coe, Ms.

The Early Woodland sites, and, in part, Middle Woodland sites, in eastern Pennsylvania show a ceramic complex with almost no decoration and with quite elemental vessel shapes. For example, the preceding types apparently represent the total ceramic complex at the Koens-Crispin Site. Despite our

general idea that pottery is the most changeable and variable phase of material culture, such pottery types as Vinette 1 appear to be more stable and more slowly modified than projectile point forms in the same complexes.

The only major discontinuity in ceramic tradition which occurs in this region comes with the introduction, whether by migration or diffusion, of several new pottery complexes into the Northeast at apparently a Hopewell time level. Ritchie's Vinette 2 series, which appears in New York at this time, is almost entirely absent in Eastern Pennsylvania. Instead, several distinct pottery types appear on the Delaware and Susquehanna Valleys. On the Susquehanna we find large, thick-walled, straight-sided to slightly everted rimmed vessels with coarse cord-marked exteriors and floated interiors, with abundant coarse crushed rock temper and crumbly, light-colored, paste. These are best represented from the upper horizon at the Poplar Island Site in Dauphin County, where the sherds occurred, with Piedmont Cord-marked as the majority are, in pits associated with medium-sized corner-notched, triangular, barbed, and semi-lozenge shaped projectile points of jasper, tiny thin retouched flake endscrapers of quartz, three-quarter grooved axes, steatite sherds, a curved-base steatite platform pipe, and pyrites fire making sets with imbedded chert strike-a-lights.[15] Some pottery of this type appears

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15. Witthoft, 1946, p. 123.
Specimens in the collections of the Pennsylvania Historical Commission and of Mark Davis, Middletown, Penna.

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also on Middle Woodland sites in Bucks County, and in subsoil beneath the Overpeck Site. (Pl. 1d) Certain nondescript cord-marked wares of southern New Jersey and Delaware may be related. This pottery type is very closely related to Ritchie's Genesee Cord-marked from the New York Hopewellian and Griffin's Woodland Cord-marked from the Sugar Run Mound and Village Site in Northwestern Pennsylvania.[16]

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16. Ritchie, 1938, p. 112-134. Information from Dr. James B. Griffin and examination of specimens in Ceramic Repository of the University of Michigan.

The poorly-known mound complex of the Susquehanna Valley is characterized by two very similar pottery types, Clemson Cord-marked and Clemson Fabric-impressed, which apparently formed the total ceramic complex at the Clemson's Island Mound and Book Mound, Dauphin County, and also characterize the Hartly Hall Mound at Hunsey, Pennsylvania.[17] The necks of the cord-marked type are

17. Collection in the Pennsylvania State Museum, Harrisburg.

generally covered with horizontal paddle-edge impressions; the fabric-impressed type rarely so. Lip interiors generally show a row of oblique paddle-edge impressions. Clemson Fabric-impressed has been wrapped in a medium-coarse wicker and then malleated, presumably with the same type of cord-wrapped paddle. Lip eversion and neck constriction are moderate to strong, and bases are sub-conical to somewhat rounded. A row of punched-through nodes generally encircles the rim of either type. Paste is poorly fired, coarse and granular, red to white to black, and tempered with abundant crushed and disintegrated rock; crushed chert is a very frequent temper. Interiors are floated and fillet contacts rare. These pottery types seem to be entirely absent from Allegheny, Genessee, and Ohio Valley mounds, and the types which characterize those sites are unknown from the Susquehanna River mounds. The Clemson types are abundant on non-mound sites of the upper Susquehanna Valley, often association with abundant triangular arrowpoints, and are closely related to characteristic pottery of late Point Peninsula and early Owasco horizons in New York. The Clemson Focus would appear to be the immediate ancestor of the earliest Owasco of the upper Susquehanna Valley. The other major type (Abbott zoned) introduced into the Delaware Valley is best represented at Abbott Farm in New Jersey, which seems to be the local center for this style, best described from the New Jersey material.[18] These are thick-walled,

18. Cross, 1941, pl. 60A, fig. 4, pl. 69B, fig. 7, Holmes, 1903, pl. 158.

soft, square-lipped, conical-bottomed vessels tempered with coarse crushed shell or rock, some few with a sharply defined rim. The neck or rim area for several inches below the lip is covered with elaborate, zoned designs outlined in incising or dentate-stamping, the zones blank or filled with incised or dentate stamped, cross hatching or herringbones outlining triangular and diamond-shaped areas which are blank or filled with cross hatching or net impressions. (Pl. 1e, f, g.) This pottery type is ancestral to Overpeck incised of the protohistoric Delaware sites, described later, to Slaughter Creek Incised from Delaware,[19] to Indian Head Incised of New Jersey,[20] and

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19. Omwake, 1935.
Ritchie, 1936, p. 234.
Statements based on the examination of Davidson's Slaughter Creek material and other specimens in the Museum of the Archaeological Society of Delaware, Newark, Delaware.

20. Cross, 1941, p. 47, pl. 10b, fig. 1, 2, 4-6, pl. 12A, fig. 1-4

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to Carlyle Smith's Bowman's Brook Incised[21] of the New York City area. Some

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21. Smith, 1944, p. 93. Skinner, 1909A, p. 54-48.
Skinner, 1909B, p. 120
Skinner, 1909C, p. 226-27.

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of Volk's material from the Rowan Farm Site near Trenton, New Jersey, is transitional to these later types.[22] This Middle Woodland pottery type is

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22. Volk, 1911, pl. 112, 113 (fig. 3, 4), 114, 115.

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found north to the Water Gap. It is quite probable that the incising technique which differentiates Iroquois pottery from earlier ceramic types in New York originated here. Incising may have diffused to late Owasco horizons to the north from this area, which is the only strong center for incised pottery decoration at so early a period in the regions adjacent to the Iroquois. The introduction of this pottery style into the Delaware Valley is the only

shift in the archeology of the area which might be correlated with Delaware immigration as described in the Walum Olum text. The Early and Middle Woodland periods were characterized by a great deal of interareal contact, as indicated by trade pieces on eastern Pennsylvania sites from Ohio Adena, Ohio Hopewell, New York Point Peninsula, and other complexes not yet identified. This contact apparently came to a climax with the introduction of new ceramic styles and artifacts into eastern Pennsylvania and the entry of a dilute Hopewell complex into western Pennsylvania.

Also conspicuous in late Middle Woodland associations is a net-impressed pottery type, Popes Creek Net Impressed, best known from eastern Maryland, of sub-conical form, thick walled, soft, tempered with grit or shell, and generally undecorated.[23] The characteristic net impressions are often obscured

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23. Holmes, 1903, p. 153-155, pl. 137, 138 A.
Cross, 1941, p. 33, 59, pl. 4, 22A (fig. 5, 6).

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by the knots of the netting, which are frequently as large as the interstices, and by multiple impression of the fabric. The presence of identical net impressions within the incised zones of Abbor-zoned, discussed earlier, is a clear indication that the two types are contemporary in New Jersey.

Many Middle Woodland sites, however, have large proportions of pottery wares clearly descended from earlier local types. The sand-tempered cord-marked and the Vinette 1 styles apparently continued their existence through much of the Middle Woodland period. Particularly interesting are the Vinette 1 variants from later Middle Woodland sites. The sherds are thinner, slightly harder, and blacker than typical Vinette 1; they have a smaller proportion of finer crushed rock temper, (sometimes even shell temper) and the cord-marks on the interior and exterior surfaces are often partially obliterated and are not so coarse as on the earlier ware. Present on many eastern Pennsylvania

Middle Woodland sites, it also occurs with characteristic Vinette 1 at western Pennsylvania mound sites, where it is associated with Woodland Cord-marked sherds at a Hopewell time level.[24] The Genesee and Allegheny Valley mounds

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24. Information from Dr. William A. Ritchie, Dr. James B. Griffin, Mr. Edmund Carpenter, and Dr. Claude E. Schaeffer and from examination of the collections of the Pennsylvania Historical and Museum Commission.

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seem to mark the beginning of a Middle Woodland period in the northeast, and are earlier than the Susquehanna mounds.

The Late Woodland period is apparently a time of more sedentary life and greater areal isolation. At least three regions of distinct development must be recognized for the Delaware, and at least two for the Susquehanna. Trade pieces which have been carried long distances are uncommon although trade sherds from nearby regions are frequent, and greater areal differentiation is apparent. Projectile point types and pottery vessel shapes are very much alike at the same late horizons in these areas, however, and parallel trends are represented in each sequence.

The Delaware drainage north and west of the mouth of the Lehigh represents one area in which an Owasco-Iroquois sequence ends with historic Munsee, while the Susquehanna drainage north of the forks shows a related Owasco-Iroquois sequence which culminates in historic "Andaste" and Cayuga. Both of these areas were culture and population centers, with a great variety of ceramic types, many of them transitional, which seem to stem from Woodland Cord-marked, Vinette 2, and Clemson pottery styles in the late Middle Woodland period. In late prehistoric times, these areas exerted considerable influence on pottery styles throughout the lower Delaware and Susquehanna Valleys. At an early historic time level ceramic complexes from these northern areas were replacing the already-modified ceramic styles of more southern groups. Any adequate discussion of the Munsee and Andaste areas would require much more data than I yet have available.

In the Lebanon-Lancaster Counties area on the Susquehanna, the Late Woodland ceramic complexes are related, but not very closely, to Baum Cord-marked in Fort Ancient, to Joffre Coe's Siouan pottery from Virginia, and to Gala Cord-marked from West Virginia.[25] Many of the incised sherds seem

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25. Griffin, 1943, p. 193-194, 342-343.
Fowke, 1894, p. 17-23.
Information from Joffre Coe.

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identical with a part of Karl Schmitt's Shepherd Cord-marked, described from Maryland material;[26] some of his sherds appear to be trade sherds from this area.

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26. Schmitt, ms.
Conclusion based on comparison with sherds and photographs in the Ceramic Repository of the University of Michigan.

Swatara Cord-marked is a fairly hard, disintegrated rock tempered, medium thick, brown to reddish-brown pottery with round base, heavy cord-marking, an applied rimstrip which is cord-marked and blended to the neck, and a constricted neck which is frequently encircled by several parallel incised lines. Some vessels lack the rimstrip and have an outflaring lip, with simple incised neck decoration. (Pl.) Others have a notched rim edge and parallel lines or triangular plats incised over cord-marking on the rims, and should constitute several other pottery types. (Pl.) This ceramic sequence was becoming markedly Iroquoian, and some traits which may have originated in this pottery type occur in the early historic pottery at Safe Harbor and Washingtonboro. This pre-Susquehannock sequence apparently continued in this area at Shenk's Ferry and related sites, until the contact period, and was probably then displaced or absorbed by Susquehannock invasions from the North.[27]

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27. A report on eight sites of this Shenk's Ferry focus is in preparation.

The later stage of this complex, in part contemporaneous with Susquehannock on the lower river, is characterized by sparse trade goods, abundant small triangular arrowheads, and well-made pottery which is all grit tempered and relatively homogeneous in appearance. (Runck Incised). These pots have a moderately high, strongly convex collar with no rim thickening, generally a notched lip, and incised decoration over cord-marking. The incised designs are triangular, rectangular, herringbone, and diamond-shaped plats, frequently with rows of small punctates between incised lines; some rims lack all incised decoration. Face effigies, elaborate castellations, nodes at the lower rim edge, rim thickening, designs made up entirely of triangular plats, and heavy linear punctate lines are absent. The style of incising over cordmarking looks somewhat like later Susquehannock ware. (Pl. 2, a, b, c, d). A few rim interiors show cord wrapped paddle edge impressions.

The well-known later Susquehannock shell-tempered pottery, (Schultz Incised) of the full blown historic period may be descended from this type, but shows much closer relationship to pottery from the upper Susquehanna Valley. The triangular plat designs are derived from the Andaste-Cayuga-Mohawk area. Almost grotesque over-elaboration of the high collars, effigies, castellations, linear punctate zones, noded rims, and double pots and double mouthed pots reflect trends in other areas, and may have some correlation with intense European contact and the appearance of mixed Iroquois bands in the Susquehanna Valley.[28] Finally, in late Susquehannock graves, on which trade goods were

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28. Cadzow, 1936, pl. 59, 62, 61, 63, 64, 65, 67, 68, 69, 74, 124, 125.

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lavished, we find the last Susquehannock pottery, Strickler Cord-marked. The paste is soft, poorly fired, black to brown, and tempered with small quantities of shells. Incised decoration has generally disappeared, and rims are unthickened, while the cord-marking extends to the lip and the

vessel shapes are clumsy.[29] (pl. 2, e, f). Several distinct vessel shapes,

29. Cadzow, 1936, pl. 24, 25b, 26, 27a, 28b, c.

one characterized by an everted lip, with ears, another by a high, roll-like, bulging rim, are present.

In the Bucks County area a number of small Late Woodland sites, of which the Overpeck Site at Kintnersville is typical, are located on the river bottoms. The lower level at the Overpeck Site appears to represent an Owasco time level, while the upper level is at an Iroquois time level. No Iroquois sherds were found in the lower horizon, but a few Canandaigua-like sherds were present. The majority type of the lower level was Overpeck Incised, a disintegrated rock tempered, fairly hard, gritty textured, cord-marked ware with complex non-Iroquoian incised designs on a somewhat concave neck area. The body sherds are almost always very red, while rim sherds show more brownish and blackish areas. (Pl. 2, g, h, i). Very little of this pottery type was found in the upper level, and the few rims from the upper level bore incised triangular plat designs of Mohawk-Mahican-Munsee derivation. This pottery type is closely related to Indian Head Incised of New Jersey, to Bowman's Brook Incised from the New York City area, and Slaughter Creek Incised of Delaware, and is descended from Abbott Zones. Also conspicuous from the lower level is a very soft and crumbly sand-tempered ware (Nockamixon Incised) with incised simple oblique row and herringbone designs on smoothed necks, poorly fired, and red and black in color. (pl. 2, j). Similar sand-tempered sherds, more heavily cord-marked and without decoration, (Nockamixon Cord-marked) were conspicuous in the upper level. These wares are apparently descended from local sand-tempered pottery types whose history extends back into the Early Woodland period in this area. In the upper level, Iroquois-Owasco types have largely replaced the local incised wares. All of the Owascoid rims from the upper level have thickened collars, and the paste is harder,

better fired, and gray to red gray in color. Fine cord-marking on the body-sherds has been smoothed over. The Iroquois series is closely related to that of the Munsee area, and portions of several shell-tempered Susquehannock trade pots were found.[30]

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30. These statements are based on MacNeish's recent study of Iroquois ceramic traits, soon to be published.

The nearby Diehl Site, at Monroe, yielded a very small sample of probably historic Delaware pottery. Owascoid sherds like those of the upper level at Kintnersville were present, with Iroquois sherds of Mohawk-like appearance. Susquehannock-like sherds are represented in the sample by shell and grit tempered sherds with incised decoration over cord-marked rims, and notched flat lips. They suggest Susquehannock techniques and yet are somewhat distinct from any Susquehannock material with which I am familiar. It is unfortunate that more of the Diehl Site was not preserved, for this site appears to represent a seventeenth century Delaware town.[31]

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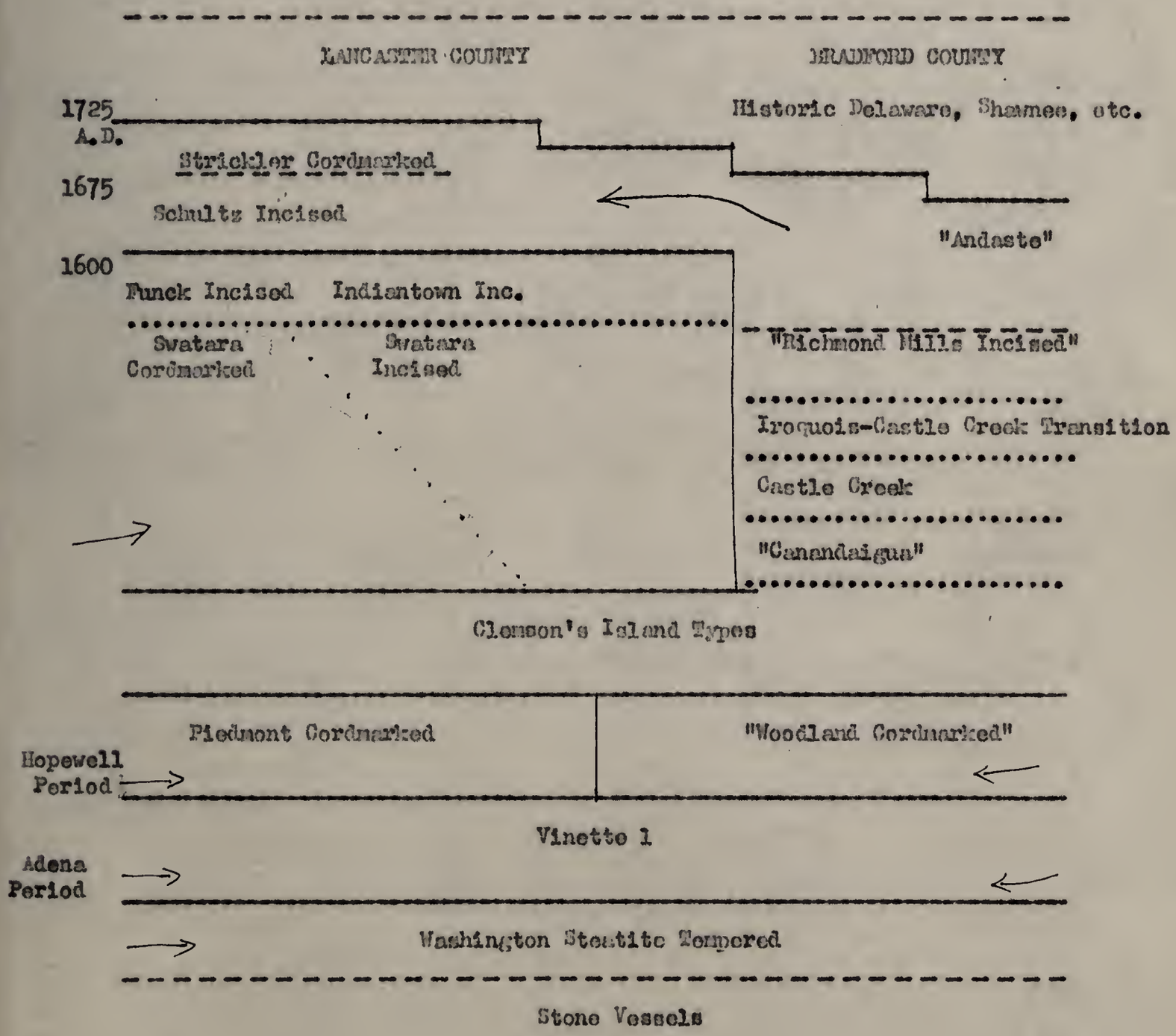
31. The Diehl site was partially excavated by MacNeish and myself in July, 1947, and a report is in preparation.

CHART I - SUSQUEHANNA VALLEY SEQUENCES

Solid lines indicate apparent discontinuities; dotted lines indicate apparent intergrading transitions; dashed lines indicate inferred continuity with transition; oblique lines only show changes in proportion within a complex rather than chronological or geographical division. Arrows point from the apparent direction of derivation of a tradition. The directions of influence and of derivation of single ceramic features, such as shell temper, are not indicated.



WITHDRAWN FROM DISCARDS